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LWG
LOWER WILLAMETTE GROUP

PORTLAND HARBOR RI/FS

TREATMENT BENEFICIAL USE MARKET SURVEY

DRAFT

April 3, 2009

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Prepared for:
The Lower Willamette Group

Prepared by:
Anchor QEA, LLC

A09-02

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List of Acronyms

ADC	Alternative Daily Cover
AOCs	Areas of Concern
CDF	Confined Disposal Facility
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEQ	Oregon Department of Environmental Quality
DOT	Department of Transportation
Ecology	Washington State Department of Ecology
EPA	United State Environmental Protection Agency
FS	Feasibility Study
GLA	Gene Leverton and Associates
iAOPCs	initial areas of potential concern
iCOCs	initial chemicals of concern
LWA	lightweight aggregate
LWG	Lower Willamette Group
NPDES	National Pollution Discharge Elimination System
ODOT	Oregon Department of Transportation
PRGs	Preliminary Remediation Goals
RGs	Remediation Goals
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

1.0 Introduction

In response to comments provided by U.S. Environmental Protection Agency (EPA) on the Draft Treatability Study Literature Survey Technical Memorandum (Treatability Study; Anchor 2007), the Lower Willamette Group (LWG) has prepared this technical memorandum to research additional information necessary to determine the economic feasibility of remedial alternatives that include sediment treatment. The intent is to gather as much information as practicable prior to initiation of the remedial alternatives development during the Feasibility Study (FS). Relative to disposal, treatment technologies are typically more expensive alternatives to manage dredged contaminated sediments. However, if beneficial use materials produced as the result of sediment treatment could be sold to offset the treatment cost, treatment technologies could become economically viable compared to disposal in some cases. In order to collect this information, an initial market survey was conducted to assess the possible demand and marketable costs of the beneficial use materials identified.

After EPA review, the information contained in this survey will be used, along with other types of information, to develop the Treatment Technologies Screening Table that will provide an initial screening of treatment technologies that will be carried into the project FS. It should be noted that the key factors in comparing treatment-based alternatives to other remedial alternatives is the effectiveness of the technology with respect the type and magnitude of the chemicals of concern (COCs) present and the price charged by treatment vendors. The latter is highly variable and is a function of cleanup goals and treatment volumes, as well as, several other logistical factors (e.g., availability of staging areas and project duration). The Screening Table is expected to be submitted to EPA in approximately May 2009 as final Areas of Concern (AOCs) and Remediation Goals (RGs) are established.

The remainder of this document is organized as follows:

- Section 2 summarizes the treatment technologies with potential beneficial use products and discusses potential applications for the products.
- Section 3 provides a description of the information collected to determine the potential current and future marketability and demand for the beneficial use products identified in this study.
- Section 4 provides a summary of the study findings, as well as recommendations for use of this information as the FS process progresses.

2.0 Potential Beneficial Use Products

This section summarizes the ex situ treatment technologies discussed in the Treatability Study and identifies the technologies that result in potential beneficial use products. In situ technologies discussed in the Treatment Study were not revisited in this memorandum, as no beneficial use products would be produced as a result of those treatment processes. Similarly, the beneficial use materials produced by biological treatment methods include bulk fill or topsoil-like materials. These products are not significantly different than material produced by many of the thermal or physical/chemical methods. Additionally, biological treatment methods are less likely to achieve potential beneficial use criteria in comparison to physical and chemical methods; therefore, a discussion of biological treatment methods has been omitted.

2.1 THERMAL METHODS

Thermal treatment processes use heat to destroy contaminants via burning or decomposition, immobilize contaminants through melting, or separate contaminants through volatilization. A brief description of the thermal treatment processes identified in the Treatability Study follows:

- Incineration volatilizes and combusts organic materials at high temperatures ranging from 1,400 to 2,200°F.
- Pyrolysis destroys organic materials by application of heat in a low oxygen atmosphere.
- Thermal desorption is a thermal-induced physical process that uses heat to separate contaminants from sediment by volatilization.
- Vitrification melts sediment particles, which destroys organic constituents and incorporates metals into a glass aggregate structure through a thermal solidification process.

2.2 PHYSICAL AND CHEMICAL METHODS

Physical and chemical treatment technologies remove contaminants from the sediment matrix through destruction, dilution, separation, or immobilization. The physical and chemical processes identified in the Treatability Study are briefly discussed below:

- Particle separation uses gravity settling, sieving, hydrocyclones, or similar technologies to separate sediment particles by size. Because contaminants are typically bound to fine-grained material, contaminated material can be isolated.
- Sediment blending reduces contaminant concentrations by blending dredged sediment with clean aggregate.

- Stabilization/solidification involves the addition of pozzolanic reagents, such as Portland cement or fly ash, or asphalt to dredged sediments. This process immobilizes or binds contaminants into a chemically stable form that is less soluble and/or less toxic.
- Sediment washing utilizes physical processes, such as physical collision, abrasion, and cavitation; and/or chemical techniques, such as oxidation using chelating agents, surfactants, and peroxides, to separate contaminants from sediments.
- Chemical extraction uses acid or organic extractants to separate contaminants from sediments.
- Chemical oxidation converts contaminants to less toxic compounds that are more stable or inert through reduction/oxidation techniques or slurry oxidation.
- Dehalogenation removes halogen molecules from contaminants within sediments by either the replacement of halogen molecules or decomposition and partial volatilization of contaminants.

2.3 BENEFICIAL USE PRODUCTS AND APPLICATIONS

Applications for beneficial use products were identified based on discussions with vendors and EPA and a review of existing literature and technology demonstration reports. The application of beneficial use products is largely based on the physical characteristics of the material and the level of residual contamination that may be present after treatment. The remainder of this section describes beneficial use products and potential applications. Figures 1 through 3 provide a graphic summary of the relationships between treatment technologies and the associated beneficial use products.

It should be noted that although opportunities other than those reported in this study for the use of beneficial use materials may exist, it is not possible to investigate projects or products that are theoretical or in the planning/development stages. The beneficial use products presented in this document go beyond general construction fill to include uses such as blasting material and cement, but do not address market-specific products (e.g., roofing shingle granules and ceramic floor tiles).

2.3.1 Natural Aggregates

Natural, uncontaminated aggregates such as sand and rock may be obtained from treatment technologies. In particular, sand created by particle separation, blending, or sediment washing could have the following applications:

- Bulk fill at industrial sites (Brownfield redevelopment)
- Construction or Department of Transportation (DOT) projects
- Sold directly to a supplier
- Mine/quarry reclamation

- Used in construction of or disposed at a Confined Disposal Facility (CDF)
- Alternative Daily Cover (ADC) at a landfill

Additionally, sand can be mixed with compost to create manufactured topsoil, which may be used for DOT construction projects or could be sold directly to a supplier. Similarly, rock could be sold to a supplier or used in mine/quarry reclamation activities or construction projects.

2.3.2 Fill

In general, fill may be produced by most of the demonstrated treatment methods identified above. The final use of application depends on both the geotechnical properties and chemical composition of the treated material. Sediment that has been treated to non-detect levels or below the most restrictive upland criteria may be applied to a wide range of beneficial use projects as clean fill. Other treated sediment that does not meet the appropriate criteria would be evaluated on a case-by-case basis and is considered "regulated fill" for the purpose of this study. Clean fill is most likely to be generated by the thermal and chemical treatment technologies, although a significant volume of clean soil may be produced through particle separation methods. Clean fill uses include:

- Bulk fill at industrial sites (Brownfield redevelopment)
- Mine/quarry reclamation
- Construction of a CDF

Regulated fill will most likely be the product of physical treatment technologies. Uses of this material include:

- Landfill cap
- DOT/construction projects such as road/parking lot base and grading/sloping material
- Industrial sites backfill (e.g., Brownfield redevelopment)
- Placement in a CDF

2.3.3 Glass Aggregate

Glass aggregate, a primary product of vitrification, has become a growing resource and has multiple potential beneficial uses. Glass recyclers have developed markets for glass that is unable to be used in the manufacture of new containers. The King County Environmental Purchasing Program in Washington State has used recycled glass for a variety of projects in the Seattle area (King County 2006). Although the

use of glass aggregate is economical compared to traditional aggregate materials, glass aggregate use is still considered trial. Potential uses include:

- Pipe bedding
- General backfill
- Sand-blasting medium
- Filter material (recycled glass sand)
- Concrete aggregate (blended cement)
- Road base material

2.3.4 Lightweight Aggregates and Cement Additives

Other beneficial use products may also be developed as the result of thermal treatment of sediment. In general, these products included lightweight aggregate (LWA) and cement-like (pozzolanic) materials. LWA is most commonly used in concrete mixtures requiring lighter weights; however, LWA may also be used in some applications as non-structural fill. Research is ongoing regarding the use of treated sediment as a substitute for Portland cement. Depending on the treatment technology and the physical characteristics of the feedstock sediment, the quality, or grade, of the cement may vary. Accordingly, the portion of Portland cement that may be replaced in a specific concrete design is considered on a case-by-case basis to ensure that the beneficial use pozzolanic material produced is an appropriate replacement.

3.0 Beneficial Use Market Survey

Beneficial uses for different materials potentially resulting from remediation activities at the Portland Harbor site were identified. As discussed in Section 2.0, beneficial use materials such as sand, general fill, structural fill, rock, topsoil, glass aggregate, LWA, and cement additives could result from the remedial activities. In order to assess initial marketability of these products, potential end users were identified and polled regarding their usage of equivalent raw material products. This portion of the market survey investigates demand, pricing, and market trends related to potentially marketable beneficial use materials.

3.1 SURVEY APPROACH

In order to assess potential quantities of beneficial use materials that could be used, various organizations located in northern Oregon and southern Washington that either use or supply the materials were contacted by telephone. Three different types of organizations were contacted during this portion of the market survey including contractors, public entities, and material suppliers. Documentation of communication and responses are shown in Appendices A through C. All phone calls and email correspondence conducted during this investigation were logged. It should be noted that the responses from specific entities are listed anonymously to protect this resource.

3.1.1 Contractors

Contractors, and indirectly public entities, are likely the largest group of potential end users of any beneficial use materials resulting from the Portland Harbor project. The projects that contractors work on require significant amounts of materials. Contractors were polled regarding whether they use sand, LWA, manufactured topsoil, non-structural cement, and glass aggregate; the approximate quantity of each material used per year; the impacts of transportation fees on material selection; and the approximate price paid for the materials. Additional important aspects of the market survey were to determine how the source of a material impacted its selection (e.g., would dredged sand be acceptable), the general approval process for source materials, and if the contractor would be receptive to using beneficial use materials (or materials that have been treated below applicable regulatory levels). The purpose of these questions was to assess the current market for materials such as sand, topsoil, and glass aggregate.

A list of contractors was compiled by examining the Oregon Department of Transportation Award Contracts website (ODOT 2008) and the Washington State Department of Transportation Project Bid Results and Contract Awards website (WSDOT 2008). The contractors were then reviewed for their proximity to Portland and the project site, which was typically limited to 30 to 45 miles from the Portland Harbor project.

Overall, 19 contractors were contacted and responses of varying detail were obtained from 31 percent. Appendix A contains the responses from each of the contacted contractors.

3.1.2 Public Entities

Public entities in the vicinity of the Portland area were also contacted. These entities included city and county governments, ports, and regional departments of transportation such as Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), Western Federal Lands Highway Division of the Federal Highway Administration, City of Portland, City of Vancouver, Port of Portland, Port of Vancouver, Clackamas County, Multnomah County, and Clark County. These public entities are generally involved in both site development and large scale transportation projects. This work is typically awarded to contractors for final implementation. Thus, it was anticipated that public entities could evaluate current market conditions and potential future conditions. Public entities were polled regarding the same questions as the contractors as far as materials used, approximate quantities and prices, material source, and approval processes. Additionally, public entities were questioned regarding price trends, potential for upcoming projects requiring industrial level fill materials, public perceptions of material sources, and incentives in contracts for use of recycled material.

Fifteen public entities were contacted and 53 percent responded to some aspect of the survey. Appendix B contains the results of the market survey as it pertains to public entities.

3.1.3 Material Suppliers

Material suppliers were contacted to obtain current prices of raw materials in the Pacific Northwest as a baseline for potential marketable prices associated with treated sediment. Materials such as sand, topsoil, and glass aggregate were identified beneficial end use materials resulting from treatment technologies. Thus, material suppliers were contacted as a supplemental source of pricing information and gauge of market demand of raw materials.

Material suppliers were located using general internet searches, contacts from past projects, and construction-specific internet search engines such as The Blue Book of Building and Construction. Each supplier was polled regarding the price per cubic yard or price per ton of each material they provide and how they typically assess delivery fees. In addition, depending on the conversation, the material supplier might have been questioned regarding the volatility of the market and their impressions on the future and whether there has been a decrease in demand and projects. Appendix C contains responses from material suppliers.

A brief description of the number of suppliers that were contacted and the percentage of responses garnered follows.

- **Sand.** Sand suppliers within 25 miles of Portland were contacted. Of the 14 suppliers contacted, 57 percent responded.
- **Topsoil.** Ten topsoil suppliers within 25 miles of Portland were contacted. Responses were obtained from 40 percent of those contacted.
- **Glass Aggregate.** Four suppliers of glass aggregate in the Portland-Seattle region were identified and contacted. Of the suppliers contacted, 50 percent responded regarding the product. The other 50 percent indicated that they no longer supply the material.

3.2 POTENTIAL MARKET DEMAND

The survey responses indicated that there was a relatively consistent demand for clean aggregate and topsoil; however, the demand for recycled (i.e., beneficial use) materials was variable. Overall, sand was the material most used by contractors contacted through the survey. However, approximate annual contractor demand for any particular material was difficult to obtain because contractors stated that material quantities were project-specific and thus annual demand was difficult to estimate. Similarly, contractors indicated that material selection was also driven by project specifications and requirements as well as price, including materials and delivery. Responses regarding the requirements used to approve material for project use ranged from visual approval to specific chemical and geotechnical testing.

Many contractors pointed out that ODOT Specifications allow for and detail the requirements for substituting reclaimed glass (mixed waste cullet) for traditional aggregates for use as non-structural fill. Similarly, WSDOT Specifications contain requirements for recycled material such as glass aggregate. In Washington, contractors must certify that the recycled material is not a Washington State Dangerous Waste under Washington Administrative Code (WAC) 173-303. The WSDOT Specifications indicate that recycled glass may be used, in various percentages, for ballast; shoulder ballast; crushed surfacing; aggregate for gravel base; gravel backfills for Class A and B foundations, walls, pipe zone bedding, drains, and drywells; backfill for sand drains; sand drainage blankets; gravel, select, and common borrow; Class A, B, and C foundation material, and bank run gravel for trench backfill.

The reported demand for general fill material varied by respondent. Several public entities stated that they have a few very large potential projects that may occur within the next several years and will require extensive amounts of material; other entities stated that it is currently very difficult to get rid of excess material in the Portland Harbor area. Additionally, public entities that conduct a variety of excavation and filling projects often stockpile excavated material for future use, thus reducing or eliminating the need to purchase additional fill material.

At the onset of this market survey, public entities were anticipated to be a potential source of specific annual material demand because they create annual budgets. The

survey indicated that public entities specify materials on a project-by-project basis and generally, with the exception of topsoil, these materials are not broken down into separate bid items. Public entities stated it would take a substantial amount of time to compile this information from various projects and departments within their organization. Thus, very little specific "annual" usage or trend data were obtained.

While sand is a relatively inexpensive material in the region, coarser aggregate costs fluctuate over a larger range. Use of reclaimed materials is allowed by most entities and beneficial use products such as glass aggregate, LWA, and pozzolanic materials may be acceptable substitutes for raw materials.

In addition to questions regarding demand, the public entities were polled regarding the environmental and physical specifications that they use to approve import material for their projects. In general, the responses indicated that more emphasis was placed on specific physical specifications, such as gradation, rather than environmental criteria. For entities that did have environmental guidelines, the criteria required that the material not be listed or characterized as hazardous or dangerous waste and that testing be performed to demonstrate that the material did not exceed a reasonable risk-based level (e.g., exposure to material placed as roadbed would be lower than exposure to topsoil placed in a public park). The remainder of this section summarizes the results of an ongoing, detailed study regarding the demand for sand in the Portland Harbor region.

The Port of Portland provided a series of studies prepared by Gene Leverton and Associates (GLA) in 1997, 1999, 2002, and 2005 on Columbia River Sand Markets. Currently, an update to these studies is in preparation. The objective of the studies is to determine the current commercial market demand for dredge sands from the Columbia River and to assess potential impacts to the strength of future demand (GLA 1997).

Dredge sands comprise a portion of the Portland market for sand. In the 1990s, dredge sand was primarily used as fill material. Current studies indicate that dredge sand is becoming more valuable for substitution as natural upland sand or for blending with upland sand, and is used less often as a fill material (GLA 2005). From 1992 to 2004, the amount of sand dredged from the Columbia River has ranged from a low of 327,274 cubic yards (425,456 tons, using a conversion of 1.3 tons per cubic yard) in 1992 to a maximum of 1,540,287 cubic yards (2,002,373 tons) in 1998 (GLA 2005). According to the 2005 study, the amount of sand dredged from the Columbia River is expected to range between 1.2 million and 1.7 million tons from 2004 to 2007-2009 and the dredge sand in the Portland market is increasing in value (GLA 2005). By 2009, the overall sand market in the Portland area, including dredged sand and sand from upland sources, is expected to be approximately 3.25 million tons per year (GLA 2005).

The sand studies indicate that the role of dredge sand in the Portland Metro market is changing. In 1997, 75 percent of dredge sand was used for fill, 10 percent was used

for Ready Mix, 10 percent was used for asphalt, and 5 percent was used for golf courses and other miscellaneous uses (GLA 1999). Future projections indicated that by 2007-2009, 40 percent of sand would be used for Ready Mix, 30 percent for asphalt, 25 percent for fill, and 5 percent for miscellaneous uses (GLA 2005). This represents a significant shift in dredge sand usage.

Fill sand has the lowest cost because of broad specifications and relatively small amount of processing. As expected, sand meeting standard specifications for hardness, sieve analysis, and purity fetch higher prices. Because the price per ton of sand is relatively low, the price of sand is very sensitive to transportation costs. Sand with a higher value, such as that which has been processed to specifications, can incorporate higher transportation costs and be distributed to markets that are further from the source while still remaining competitively priced. Therefore, it is beneficial to market fill sand, or other low value sand, as close to the point of production as possible (GLA 2002).

Barge and rail transport of sand is becoming an increasing economical and preferable type of transportation. In 2005, GLA identified the following locations of stockpiled sand near the Portland area.

Table 1. Portland Area Dredge Sand Stockpile Sites (GLA 2005).

Company	Barge Site Locations	River Mile
Morse Brothers	Waterview, Columbia City	C 82.6
	Troutdale	C 120
Rinker	Chinook Landing	C 118.5
Glacier	Blue Lake	C 118
	Front Avenue	W 7.2
	Linnton	W 4
	Scappoose (Multnomah Channel)	C 87
Fazio Bros.	Vancouver	C 97.1

Note: "C" indicates the Columbia River and "W" indicates the Willamette River.

3.3 MARKETABLE PRICING

In order to understand the potential market value of materials that may be created by the remedial activities at Portland Harbor, prices for each of the materials discussed in Section 3.1.3 were investigated. An updated range of prices of sand, topsoil, and glass aggregate is provided in Table 2.

Table 2. Range of Beneficial Use Material Prices.

Material	Low Price per Unit[1]	High Price per Unit[1]	Unit
Sand	$3.75	$20.75[2]	ton
Topsoil	$7.50	$26.00[2]	cubic yard
Glass aggregate	$2.50	$7.00	ton

Notes:
1 Prices do not include transportation.
2 Smaller material suppliers typically had higher prices for materials such as sand and topsoil.

Material prices shown in Table 2 do not include transportation or delivery fees. As anticipated, suppliers indicated that transportation costs are generally based on the distance to the job site and current fuel costs. Generally, suppliers indicated that material prices have been relatively stable and are expected to increase slightly in the future. A few suppliers were unsure of market trends given instability in the economy. Suppliers stated that the greatest volatility in prices is generally in delivery fees. Smaller, local suppliers also indicated that although there appeared to be fewer smaller ('homeowner type') projects occurring, larger commercial orders were still relatively strong.

4.0 Conclusions

The primary goal of this study was to assess the demand and marketability of potential beneficial use materials that may be generated during Portland Harbor remedial activities. The intent of the document was not to develop final costs for these materials or the processes (i.e., treatment technologies) that may be used to generate them. An evaluation of the cost and effectiveness of treatment technologies will be performed as part of the FS once AOCs and RGs are established. In addition to the effectiveness of a given technology to treat site COCs, a key factor in comparing treatment options (including beneficial use offsets) to other remedial alternatives is the price charged by treatment vendors. Evaluations performed prior to AOC and RG finalization and the identification of staging/processing areas would be highly speculative as technology vendors would not have sufficient information necessary to develop costs specific to the Portland Harbor project.

4.1 BENEFICIAL USE MARKET SURVEY

In general, the study determined that prices for natural aggregate have been continually rising in the Portland Harbor region, in part, due to rising energy costs. The ability to predict the prices of these natural materials and ultimately any beneficial use substitute materials at the time of construction is extremely difficult.

Accordingly, these conclusions focus primarily on the potential demand for these materials rather than the economic viability. Of the beneficial use products researched in this study, those associated with construction applications such as cement-like materials (for the production of concrete) and clean aggregate (fine and coarse) are in the most demand. As previously discussed, this market survey determined that public entities and contractors specify materials for projects on a project-by-project basis and specific material quantities are not readily available. The general results of the most recent sand surveys indicate that the sand market in the Portland Harbor area is tightening and a greater portion of the dredge sand is being used in development applications in lieu of reclaimed soils. Material generated from the Portland Harbor project is likely to contain 40 to 50 percent fines based on preliminary data. Approximately 20 percent of the total potential volume may yield clean sand (i.e., less than 10 percent fines) without significant separation processing.

Although many public entities and landfills indicated that general fill (often reclaimed from development projects) is in low demand, there are several public entities that anticipate developing sites of substantial acreage, which would require significant amounts of fill. These projects range from requiring approximately 500,000 to 5,000,000 cubic yards of fill material and initiation times vary from within the next couple of years to approximately 20 years away. As indicated by the time to initiation, a few of these projects are in their infancy and the volume and time frame may change significantly by the time they are actually developed.

In Washington and Oregon, beneficial use applications and reclaimed materials regulated under state law by the Washington State Department of Ecology (Ecology) and the Oregon Department of Environmental Quality (DEQ), respectively. Both agencies provide guidance for acceptable contaminant levels in various media; however, no direct rules are promulgated regarding the beneficial use of treated or untreated dredged material. As the FS progresses, discussions with these agencies will be required to determine the appropriate regulatory pathway (often termed a "beneficial use determination") to allow for use of clean aggregate and beneficial use product derived from the Portland Harbor project, beyond the jurisdiction of the project limits governed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

4.2 LIMITATIONS OF MARKET SURVEY

The quality and quantity of information obtained through this market survey was subject to many conditions. Although phone calls were placed to many organizations, as documented in Appendices A through D, the willingness and ability of the entity to respond directly impacted the results. Additionally, the nature of the information sought during the market survey often required input from multiple individuals within each organization, and coordination and correspondence was often challenging. It is important to note that the demand for potential beneficial use applications identified herein can change rapidly with time and any information gained during this market survey could become inapplicable or irrelevant to future conditions (i.e., at the time of remedial action). Market volatility and economic conditions are also likely to impact future demand for materials and the information presented in this document may not reflect the conditions at the time of construction. The LWG will continue to communicate with various organizations contacted as part of this study to track fluctuating material demand and identify new potential beneficial use applications in the Portland Harbor regions.

5.0 References

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Figures

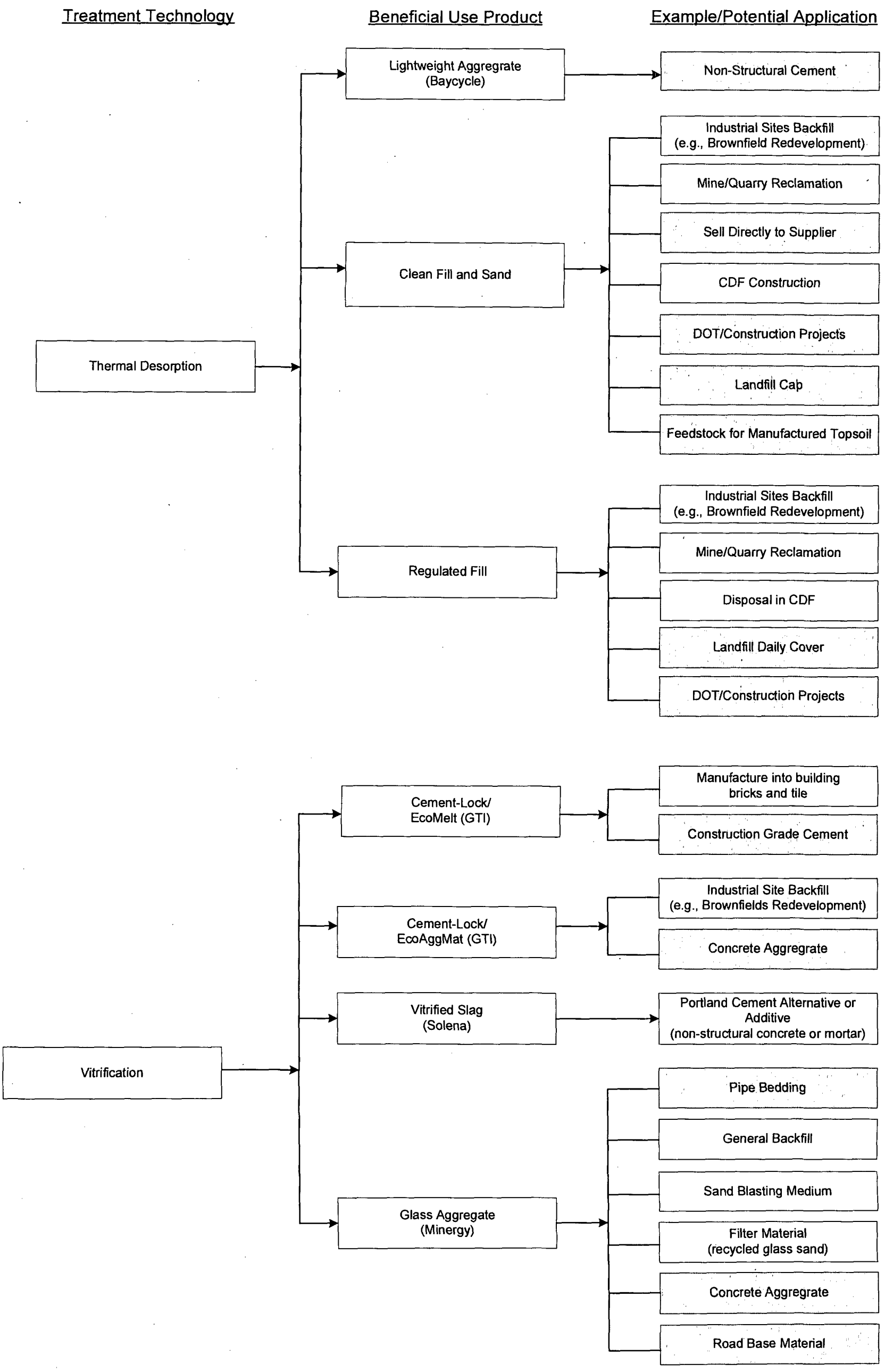

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Figure 1
Beneficial Uses of Thermal Treatment Technology Processes
Initial Beneficial Use Market Survey

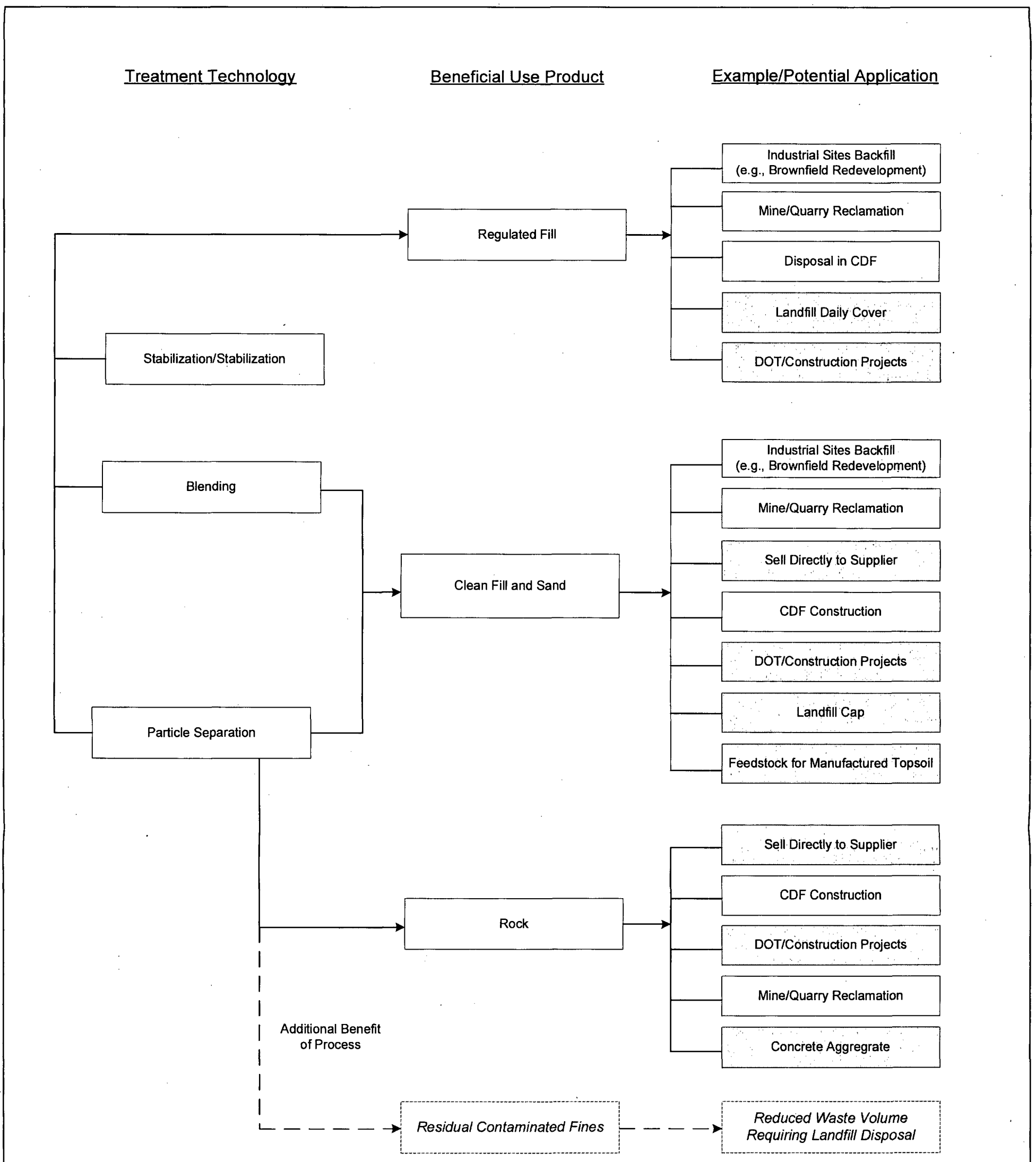

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Figure 2
Beneficial Uses of Physical Treatment Technology Processes
Initial Beneficial Use Market Survey

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Transmittal

To:	Chip Humphrey EPA Operations Office 805 S.W. Broadway, Suite 500 Portland, OR 97205	**From:**	Carl Stivers, Anchor Environmental
Re:	Portland Harbor RI/FS	**Date:**	April 3, 2009

We are sending the following items:

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These are transmitted:

☐ For your information ☐ For action specified below ☐ For review and comment ☐ For your use ☐ As requested

Comments:

Cc:
Eric Blischke, EPA Operations Office
Jim Anderson, Oregon DEQ
David Ashton, Port of Portland (CD)
Ted Buerger, US Fish & Wildlife Service
Brian Cunninghame, Confederated Tribes of the Warm Springs Reservation of Oregon
Tom Downey, Confederated Tribes of the Siletz Indians
Erin C. Madden, Nez Perce Tribe
Robert Neely NOAA
Audie Huber, Confederated Tribes of the Umatilla Indian Reservation
Rose Longoria, Yakama Nation (transmittal only)
Jim McKenna, Port of Portland
Kristine Koch, US EPA (plus 1 CD)
Dana Davoli, US EPA
Valerie Oster, LWG Library Repository Copy
Preston Sleeger, US Department of the Interior (Transmittal Only)
Jeff Baker, Confederated Tribes of the Grand Ronde
Robert Wyatt, NW Natural
Patti Howard, Columbia River Inter-Tribal Fish Commission
Rick Kepler, ODFW
Steve Purchase, ODSL
Sheila Fleming, for Yakama Nation, Ridolfi Inc.

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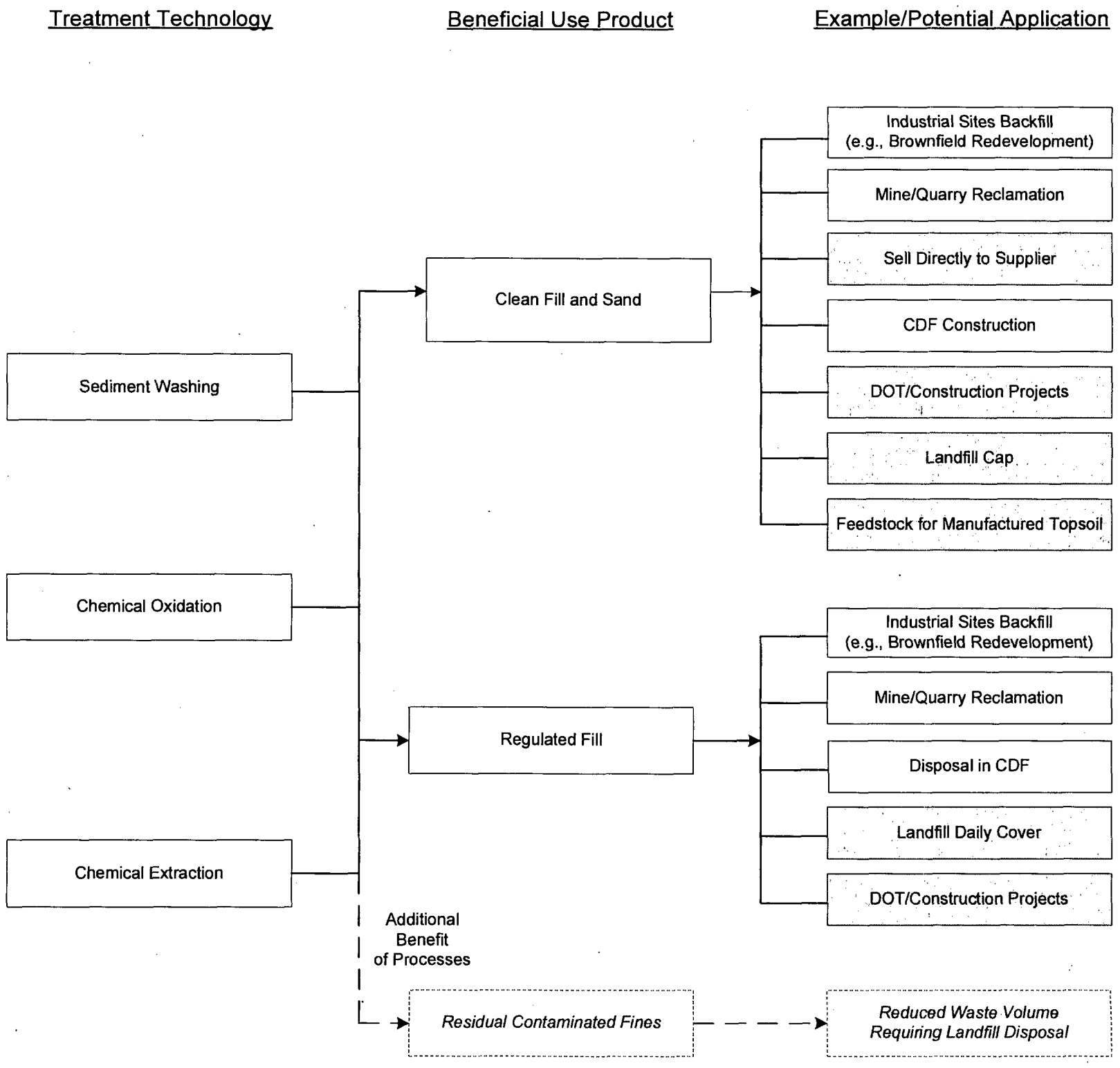

Shaded boxes indicate beneficial use applications with potentially greater market demand within the Portland Harbor region

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Figure 3
Beneficial Uses of Chemical Treatment Technology Processes
Initial Beneficial Use Market Survey

Appendix A
Initial Market Survey Response – Contractors

Initial Market Survey Response - Contractors

Communication Log

Initial Market Survey Response – Contractor 7

Initial Market Survey Response – Contractor 8

Initial Market Survey Response – Contractor 12

Initial Market Survey Response – Contractor 15

Initial Market Survey Response – Contractor 18

Initial Market Survey Response – Contractor 19

Note: Communication Log details communications with all Contractors. Partial or complete responses from Contractors are included in this appendix. For cases in which contact was not established or no information was garnered, response forms have been omitted.

Initial Market Survey Responses - Contractors

Communication Log

Date	Communication
Contractor 1 (C1)	
11/18/2008	Phone call placed to C1, line busy
11/24/2008	Two phone calls placed to C1, line busy, phone number verified
1/9/2009	Contact not established with C1
Contractor 2 (C2)	
11/18/2008	Phone call placed to C2, left voicemail
1/9/2009	Contact not established with C2
Contractor 3 (C3)	
11/18/2008	Phone call placed to C3, left voicemail
1/9/2009	Contact not established with C3
Contractor 4 (C4)	
11/18/2008	Phone call placed to C4, left voicemail
1/9/2009	Contact not established with C4
Contractor 5 (C5)	
11/18/2008	Phone call placed to C5, C5 asked to be contacted at a later date
11/24/2008	Phone call placed to C5, left voicemail
1/9/2009	Contact not established with C5
Contractor 6 (C6)	
11/18/2008	Phone call placed to C6, C6 stated they were unable to respond to survey
1/9/2009	No information garnered from C6
Contractor 7 (C7)	
11/18/2008	Phone call placed to C7, left voicemail
11/21/2008	C7 returned phone call, notes from discussion recorded
1/9/2009	No further contact with C7
Contractor 8 (C8)	
11/18/2008	Phone call placed to C8, C8 asked to be contacted at a later date
11/24/2008	Phone call placed to C8, left voicemail
12/1/2008	C8 returned phone call, notes from discussion recorded
1/9/2009	No further contact with C8
Contractor 9 (C9)	
11/18/2008	Phone call placed to C9
11/24/2008	Phone call placed to C9, left voicemail
1/9/2009	Contact not established with C9
Contractor 10 (C10)	
11/6/2008	Phone call placed to C10, C10 unwilling to participate
1/9/2009	No information garnered from C10

Date	Communication
Contractor 11 (C11)	
11/18/2008	Phone call placed to C11
11/24/2008	Phone call placed to C11, left voicemail
1/9/2009	Contact not established with C11
Contractor 12 (C12)	
11/6/2008	Phone call placed to C12, notes from discussion recorded
1/9/2009	No further contact with C12
Contractor 13 (C13)	
11/6/2008	Phone call placed to C13, left voicemail
1/9/2009	Contact not established with C13
Contractor 14 (C14)	
11/18/2008	Placed phone call to C14
11/24/2008	Placed phone call to C14, limited response from C14 – C14 is a concrete subcontractor and does not use any of the materials listed in survey
1/9/2009	No further information garnered from C14
Contractor 15 (C15)	
11/18/2008	Phone call placed to C15, C15 asked to be contacted at a later date
11/24/2008	Phone call placed to C15, limited response from C15, notes recorded
1/9/2009	No further contact with C15
Contractor 16 (C16)	
11/18/2008	Phone call placed to C16, left voicemail
1/9/2009	Contact not established with C16
Contractor 17 (C17)	
11/18/2008	Phone call placed to C17, C17 asked to be contacted at a later date
11/24/2008	Phone call placed to C17, left voicemail
1/9/2009	Contact not established with C17
Contractor 18 (C18)	
11/18/2008	Phone call placed to C18, C18 asked to be contacted at a later date
11/24/2008	Phone call placed to C18, notes from discussion recorded
1/9/2009	No further contact with C18
Contractor 19 (C19)	
11/18/2008	Phone call placed to C19, notes from discussion recorded
1/9/2009	No further contact with C19

Initial Market Survey Responses – Contractor 7 (C7)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

C7 uses sand for concrete, but acceptable sand sources are dependent on specification. Sand is also used for non-concrete layer use but most gradation requirements are often contract specific. C7 has historically used manufactured top soil. Use of non-structural cement is driven by specifications or in a design-build contract in which non-structural pavement may meet performance goals (non-structural cement might be used in substructure or cement treated base). Glass aggregate may have been used on occasional projects (generally parking lots—not roadways). C7 particularly remembers at least one project with Portland Bureau of Environmental Services. However, glass aggregate mechanically degrades quickly and changes gradation/distribution (may still be used in projects with wider allowances). Additionally, glass aggregate has potential health hazard for workers due to inhalation of glass shards.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Material use depends on project specifications and varies widely on an annual basis. C7 seeks out material on a project-by-project basis depending on proximity of use and transportation. This contractor does not do private development; therefore, all project specifications are driven by public agency specifications (i.e., Oregon Department of Transportation). In any case, a minimum amount of material is purchased for specific projects.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

Project specifications.

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Maufactured top soil is bulky and expensive to haul. Prices are generally project specific.

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

Demand is project driven.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Materials are typically not precluded from use; however, materials could be excluded based on quality. The acceptance process includes determining if there is a potential risk to the workers. Dredge sands are generally acceptable with some processing to meet gradation requirements.

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

C7 has experience working with contaminants on a local level.

8. How do transportation/delivery fees impact your selection of materials?

Materials are usually chosen based on how close they are to point of use. Price relects the proximity based on ease of use.

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Yes

10. Could you describe the current price trends for these materials?

Historically, in the past 4 to 5 years, prices have gone up incrementally. The most significant portion of the cost is usually transportation.

General Notes:

- Recently, C7 has not been competitive in the Vancouver/Portland area.
- C7 will not stockpile materials before they have a demand (i.e., project).

Initial Market Survey Responses – Contractor 8 (C8)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Sand; Glass aggregate will not work for their application (won't stick to asphalt).

2. How much of each material (e.g. sand) does your entity specify for projects each year?

5,000 tons of sand

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Sand: $12/ton

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

Definitly interested in more economical prices, same demand would be likely.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Materials would have to meet graduation requirements. Dredge sand is fine and is already being used at one plant right now. The source of the material is not that important as long as it is environmentally safe.

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

Yes.

8. How do transportation/delivery fees impact your selection of materials?

Everything comes down to price. All aggregates used by the plant on Willamette River are delivered by barge.

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Yes.

10. Could you describe the current price trends for these materials?

General Notes:

- C8 buys asphalt from gas companies (such as Chevron) and mixes sand, aggregate, and recycle together to make asphalt cement..
- C8 has 3 plants in Portland.

Initial Market Survey Responses – Contractor 12 (C12)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

C12 uses sand for backfilling concrete (generally stormwater) structures and for pipe bedding. Also uses non-structural cement for roadway subgrades and glass aggregate for pipe bedding and driveways.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Amount of material used depends on types of projects and who specified it. Generally, this contractor works for public agencies who specify product and quantity.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Yes, aggregates must pass gradation and wear tests before use on projects.

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

C12 believes this would be acceptable.

8. How do transportation/delivery fees impact your selection of materials?

Generally, these fees are rolled into the price of materials.

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Yes

10. Could you describe the current price trends for these materials?

General Notes:

- C12 does a lot of contract mining.

Initial Market Survey Responses – Contractor 15 (C15)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Sand

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Depends on the project

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. How do transportation/delivery fees impact your selection of materials?

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

10. Could you describe the current price trends for these materials?

General Notes:

Initial Market Survey Responses – Contractor 18 (C18)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Sand and manufactured top soil (top soil may be native or manufactured depending on project specifications). Currently do not use glass aggregate. General inclination is that this material is being used less and less. C18 has heard of problems when used for backfill or in asphalt mixture.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Amount of material used is dependent on projects and is highly variable. Historically, annual sand use has ranged from 5,000 to 700,000 tons.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

Project demand influences material use.

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Sand: $6/ton plus transportation

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

C18 uses local engineers to have material chemically (tested for contamination) and geotechnically approved for use.

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. How do transportation/delivery fees impact your selection of materials?

Transportation and delivery fees affect the price of materials, which impacts selection.

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

10. Could you describe the current price trends for these materials?

General Notes:

Initial Market Survey Responses – Contractor 19 (C19)

Questions

1. Does your company use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Sand. The sand is used to spread on adhesive joints between new and old asphalt.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

3 to 4 loads per year. Each load contains 32 tons.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it is cost, would you use it if the price were reasonable?

C19 is an asphalt paving company. Material choice is project driven.

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Sand: $6.50-7.00/ton

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

The current sand product is super fine and is absorbed into liquid asphalt. If the alternative product was identical to the current product, C19 would have the same demand.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Sand is visually approved.

7. Would your entity be open to using beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

Yes, for their application if the material was treated to below regulatory limits, it would be acceptable for use on their projects.

8. How do transportation/delivery fees impact your selection of materials?

Cost

9. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

10. Could you describe the current price trends for these materials?

General Notes:

Appendix B
Initial Market Survey Response – Public Entities

Initial Market Survey Response – Public Entities

Communication Log

Initial Market Survey Response – Public Entity 3

Initial Market Survey Response – Public Entity 6

Initial Market Survey Response – Public Entity 8

Initial Market Survey Response – Public Entity 9

Initial Market Survey Response – Public Entity 10

Initial Market Survey Response – Public Entity 11

Initial Market Survey Response – Public Entity 13

Initial Market Survey Response – Public Entity 15

Note: Communication Log details communications with all Public Entities. Partial or complete responses from Public Entities are included in this appendix. For cases in which contact was not established or no information was garnered, response forms have been omitted.

Initial Market Survey Responses – Public Entities

Communication Log

Date	Communication
Public Entity 1 (PE1)	
11/18/2008	Phone call placed to PE1, left voicemail
1/9/2009	Contact not established with PE1
Public Entity 2 (PE2)	
10/31/2008	Phone call placed to PE2, left voicemail
11/4/2008	PE2 returned phone call, left voicemail
11/6/2008	Phone call placed to PE2, left voicemail
11/14/2008	Phone call placed to PE2, left voicemail
11/18/2008	PE2 returned phone call, left voicemail
11/21/2008	Phone call placed to PE2, left voicemail
12/5/2008	Phone call placed to PE2
1/14/2009	Phone call placed to PE2, left voicemail
1/20/2009	Contact not established with PE2
Public Entity 3 (PE3)	
10/30/2008	Phone call placed to PE3, left voicemail
10/30/2008	Phone call placed to another division of PE3
1/14/2009	Phone call placed to PE3, notes from discussion recorded
1/20/2009	Contact not established with PE3
Public Entity 4 (PE4)	
11/12/2008	Phone call placed to PE4, line busy
11/14/2008	Phone call placed to PE4, line busy
11/14/2008	Phone call placed to another division PE4, left voicemail
1/9/2009	Contact not established with PE4
Public Entity 5 (PE5)	
11/12/2008	Phone call placed to PE5, left voicemail
11/17/2008	PE5 returned phone call, left voicemail
11/18/2008	Phone call placed to PE5, left voicemail
11/20/2008	PE5 returned phone call, left voicemail
11/21/2008	Phone call placed to PE5, left voicemail
12/5/2008	Phone call placed to PE5
1/9/2009	Contact not established with PE5
Public Entity 6 (PE6)	
11/12/2008	Phone call placed to PE6, notes from discussion recorded, additional information gained via email conversation
11/13/2008	Follow up email received from PE6, information incorporated in notes
1/9/2009	No further contact with PE6

Date	Communication
Public Entity 7 (PE7)	
11/12/2008	Phone call placed to PE7
11/14/2008	Phone call placed to PE7
1/9/2009	Contact not established with PE7
Public Entity 8 (PE8)	
10/31/2008	Phone call placed to PE8
11/18/2008	Phone call placed to PE8, left voicemail
11/20/2008(?)	Discussion with PE8, notes from discussion recorded
11/20-24/2008	Email communication, information from email communications recorded
1/14/2009	Phone call placed to PE8, left voicemail
1/20/2009	Phone call placed to PE8, notes from discussion recorded
1/20/2009	No further contact with PE8
Public Entity 9 (PE9)	
10/30/2008	Phone call placed to PE9, left voicemail
10/31/2008	PE9 returned phone call, referred to another individual
10/31/2008	Phone call placed to PE9, left voicemail
10/31/2008(?)	PE9 returned phone call, notes from discussion recorded
1/14/2009	Phone call placed to PE9, left voicemail
1/20/2009	No further contact with PE9
Public Entity 10 (PE10)	
10/31/2008	Phone call placed to PE10, left voicemail
11/14/2008	Phone call placed to different division of PE10, left voicemail
1/14/2009	Phone call placed to PE10, notes from discussion recorded
1/9/2009	Contact not established with PE10
Public Entity 11 (PE11)	
11/12/2008	Phone call placed to PE11, notes from discussion recorded
11/13/2008	Follow up email received from PE11, information incorporated recorded
1/9/2009	No further contact with PE11
Public Entity 12 (PE12)	
11/12/2008	Phone call placed to PE12, left voicemail
1/9/2009	Contact not established with PE12
Public Entity 13 (PE13)	
11/12/2008	Phone call placed to PE13, left voicemail
11/14/2008	PE13 returned phone call, left voicemail
11/14/2008	Phone call placed to PE13, notes from discussion recorded
1/9/2009	No further contact with PE13
Public Entity 14 (PE14)	
12/5/2008	Phone call placed to PE14, PE14 unwilling to respond to survey
1/9/2009	No information garnered from PE14

Date	Communication
Public Entity 15 (PE15)	
10/30/2008	Phone call placed to PE15, notes from discussion recorded, also referred to another individual
10/31/2008	PE15 returned phone call, left voicemail
10/31/2008	Phone call placed to PE15, notes from discussion recorded, also referred to another individual
11/14/2008	Phone call placed to PE15, left voicemail
12/5/2008	Phone call placed to another individual at PE15, left voicemail
12/8/2008(?)	PE15 returned phone call, left voicemail
1/8/2009	Phone call placed to PE15, notes from discussion recorded
1/8/2009	PE15 placed follow up phone call, notes from discussion recorded
1/14/2009	Phone call placed to PE15, notes from discussion recorded
1/20/2009	No further contact with PE15

Initial Market Survey Responses – Public Entity 3 (PE3)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

2. How much of each material (e.g. sand) does your entity specify for projects each year?

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

PE3 follows the guidelines published in the WSDOT Specifications.

General Notes:

Initial Market Survey Responses – Public Entity 6 (PE6)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Sand is used in limited quantities under sidewalks. Glass aggregate might have been used in a pilot project a few years ago, but PE6 is unsure if it is currently being used. PE6 also uses topsoil. Typically, PE6 does not use non-structural cement because they look for strength standards in their applications.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Material is specified on a project-by-project basis, and bid items are not broken down by these types of categories, with the exception of topsoil.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Information is only available on a project-by-project basis; no summary information is available.

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

Yes, PE6 would absolutely be interested in cost savings; demand is linked to projects though.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

General Notes:

Initial Market Survey Responses – Public Entity 8 (PE8)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

PE8 uses sand, non-structural cement, and glass aggregate. Sand is used for fill, to raise the elevations of areas, for road beds, and for future foundations.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

Amount of each material used per year would have to be compiled from a variety of sources and projects. Generally, PE8 has multiple projects that require fill and projects where fill is being excavated. Excess excavated fill material is stockpiled on PE8 property. There is a potential for two projects in the future that may need volumes of material exceeding typical stockpile sizes (see question 8 for additional information).

PE8 hires a consultant to evaluate the market for sand in the Portland Metro Area. PE8 provided these reports from 1997, 1999, 2002, and 2004. PE8 anticipates that another sand market evaluation will begin in early 2009. Each market evaluation examines uses of sand in the Portland Metro Area, costs, sources, historic annual volumes of sand purchased, and provides volume predictions of future sand usage.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

Prices for materials depend heavily on location, and trucking is a significant part of the cost. Additionally, there is variation in prices depending on project specifics.

PE8 participates in dredging for the U.S. Army Corps of Engineers. Sand is then free (after dredging) and stockpiled on PE8 properties. If there is a surplus of material, this material may be cheaper or easier to obtain than purchasing materials.

For one project that was competitively bid on earlier this year, prices for fill material, including delivery, ranged from $15-35/cubic yard (these costs are highly influenced by transportation fees and whether material is purchased from a sand pit or from a stockpile).

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

In reality, contractors must come up with a source of sand or aggregate. For the contractor, there is no real difference between a sand pit and a stockpile from an old project (except cost).

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Materials generally have physical and chemical requirements. If materials meet these requirements, then it does not matter where material is from.

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

PE8 has several sites with long-term needs. One site in particular may be able to accept contaminated material (on the order of 500,000 cubic yards) and clean fill. Additionally, there are two potential projects on the horizon that may require large amounts of fill material: one that may require between approximately 500,000 to 2 million cubic yards of material in 5 to 10 years and another that may need approximately 4 to 5 million cubic yards of material in 10 to 20 years (these volumes and timelines are very approximate).

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

Transportation and delivery fees impact price.

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

11. Could you describe the current price trends for these materials?

Recently, prices have gone up.

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

PE8 has several sites with long-term needs.

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

There might be a stuggle to convince people that it is ultimately clean and structurally suitable; however, that should not prohibit its use.

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

General contract language indicates a preference to attempt to recycle material prior to disposal. PE8 is unsure if this applies to construction projects (i.e., attempt to use a recycled material for construction prior to resorting to use of a new material). For projects with demolition, whatever is practical should be recycled. For construction projects, PE8 hardly ever addresses the use of recycled material.

Requirements for Approval of Import Material:

PE8 does not have a specific set of guidelines for material approval. Restrictions that do exist are conveyed through contract language. PE8 will email applicable contract language.

General Notes:

Initial Market Survey Responses – Public Entity 9 (PE9)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

PE9 uses sand (preferably with low silt content). Glass aggregate is not currently used but could be if it was approved by the environmental department and fit the structural requirements. Additionally, PE9 is currently using dredge spoils (with limited silt content) as a fill material. PE9 has the potential to use dirt and certain soils as structural soil and may use recycled concrete/asphalt as substitution for ¾ minus rock.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

PE9 uses material that is available on a project specific basis. Currently, PE9 is filling a couple hundred acres with 600,000 cubic yards of material (already using some dredge spoils for this project). PE9 has an immediate need to fill 60 acres and is potentially in need of 1 million cubic yards of fill material in the next several years. Material must meet industrial fill requirements.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

PE9 has an agreement with the Washington Department of Natural Resources (DNR) for acquisition of DNR dredge spoils. If material is placed on site as fill and PE9 retains ownership of the property, PE9 pays low/no royalties. If property is sold, PE9 must pay higher royalties for material. Sand costs are approximately $6.00/cubic yard (material

in place) plus an additional $3.00/cubic yard to haul material. Some fill can be less than $1/cubic yard.

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

Yes, however, demand is project specific.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Yes, material source plays are a role in selection of materials, especially for sites that PE9 may want to sell in the future. PE9 must know exactly where all material brought onto these properties are from and what contaminant levels are present in fill material. Material must meet industrial fill requirements.

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

Yes, beneficial use materials are currently being used, but they must meet in-house levels in addition to regulatory standards.

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

PE9 is currently filling a 60-acre site and has other sites that need to be filled.

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

Material selection is based on cost (including transportation/delivery fees) and everything is subject to review. PE9 can accept barge shipments.

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Yes

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

Yes, PE9 is developing land and is in need of fill.

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

The material would have to be approved, even if it has passed Model Toxics Control Act levels. PE9 has previously accepted materials from other sites, however, if there is any potential for the property to be sold, PE9 must know exactly what material has been brought onto the property, where it was used, and any potential contaminants.

14. Is there something perception wise that would make a material unacceptable?

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

General Notes:

Initial Market Survey Responses – Public Entity 10 (PE10)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

2. How much of each material (e.g. sand) does your entity specify for projects each year?

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

Contact at PE10 indicated that he was not aware of a list of chemical specifications for approval of materials. PE10 uses the ODOT Specifications for physical specifications, such as gradation, to approve materials.

General Notes:

Initial Market Survey Responses – Public Entity 11 (PE11)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured topsoil, non-structural cement or glass aggregate?

PE11 uses sand, manufactured topsoil, and non-structural cement (used in applications such as pipe trenches). Additionally, PE11 uses low density fill for backfill on occasional projects.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

The amount of material specified varies by project and is generally difficult to quantify, with the exception of topsoil (which is a separate bid item). Usually, not much sand is used. The demand for non-structural cement is also low and varies by project. On most recent projects, the topsoil was incidental, so there was no direct bid item for topsoil. On two recent projects (April 2007 and July 2008), the total topsoil specified was 2,680 cubic yards.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

Material demand is project based. PE11 has no need for materials that are anticipated for a specific project.

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

The cost of topsoil used on two recent projects (one in April 2007 and another in July 2008) was $34.00/cubic yard and $38.00/cubic yard (average of $36.00/cubic yard), respectively. Adjusted for inflation using the November 2008 Construction Cost Index, the price of topsoil was approximately $38.42/cubic yard.

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

All demand is project driven.

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Generally, if the material meets specifications, material source is not an issue.

Manufactured topsoil must be tested for level of organics and bugs and meet Oregon Department of Transportation specifications.

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

PE11 avoids materials that are contaminated or were classified as contaminated. PE11 indicated that they already have enough problems with contaminated materials and that there are too many other hassles, so it is not worth the effort.

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

Transportation/delivery fees drive price, which impacts material selection.

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Demand for these materials is project driven and thus is variable.

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

Note: Based on conversation with PE11, any metion of "contamination" illicited an unfavorable response.

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

General Notes:

Initial Market Survey Responses – Public Entity 13 (PE13)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

PE13 buys clean sand for use in sand bags and for road sanding operations and pre-made cement. PE13 is in need of dense graded stream backfill (cobbles with fines). Cement is generally purchased from Knife River, Glacier Northwest, or Baker Sand and Gravel because of their established production capabilities and land use permits.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

The amount of material is specified by the projects occuring at a given time. PE13 does not purchase a lot of sand, but when they do, they are looking for specific gradations.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Material has to meet Department of Environmental Quality requirements to be used in any application.

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

PE13 indicated that the building boom appears to be slowing or is "dead" and it is difficult to get rid of excess material right now.

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

Requirements for Approval of Import Material:

General Notes:

- PE13 indicated that it was difficult to get rid of dredge spoils and virtually impossible to get rid of any material in the Portland Metro Area right now.
- PE13 suggested contacting Morse Brothers, Knife River, or similar commercial operations in regards to whether they could accept and then retail material.

Initial Market Survey Responses – Public Entity 15 (PE15)

Questions

1. Does your entity use sand, lightweight aggregate, manufactured top soil, non-structural cement or glass aggregate?

Typically, these materials are included in a contract and PE15 does not procure the materials themselves. Sand used for road sanding would be the exception.

2. How much of each material (e.g. sand) does your entity specify for projects each year?

PE15 currently has "a sea of sand" located in a variety of stockpile locations and does not anticipate an overwhelming need for additional sand; however, discrete local needs may exist.

PE15 has many uses for aggregates and classifies sand as a fine aggregate. Typically, sand is used in concrete and asphalt. For roadway fill, sand is typically not used alone but is often combined with a variety of aggregates of different sizes. Information about approximate quantity of sand used per year for road de-icing may be available online.

Overall, it would take a significant amount of time to compile material specified annually for projects.

3. If you aren't using this material(s) (e.g. lightweight aggregate), what prohibits you from using it? If it's costs, would you use it if the price were reasonable?

4. What prices are you currently paying for each of the materials (preferably a delivered cost with transportation, not placed)?

PE15 approximated that they currently pay $14-15/ton for sand. PE15 stated that prices charged by material suppliers such as Glacier Northwest are approximately what they are paying.

5. If alternatives to these materials were available at an economical price, would you see a potential to use them in more projects? If so, how much demand would you foresee?

6. Assuming it meets gradation requirements, does the source of the material play a role in the selection of your materials (i.e. would dredged sand be acceptable?)? What is the general process for approving source materials? How do you ensure material is not contaminated?

Materials must be tested for hazardous material prior to use on any project (PE15 cannot introduce heavy metals or hazardous compounds into projects). In order to approve an aggregate source, the source is sampled, tested for gradation (additional tests are conducted on material that may be used to make concrete) and chemical composition. If it meets the certification, any contractor working on projects for PE15 may use this source. PE15 is unsure whether a dredge sand source has ever been approved. It might be within the realm of possibility if stockpile of dredge sand was created and sampled, then stockpile could potentially be approved as a source.

7. Would your entity be open to use beneficial use materials (i.e. materials that have been treated to below appropriate regulatory levels)?

If PE15 tested material and it met chemical and gradation limits, material might be okay. PE15 indicated that it is a little wary about using stuff from sources with known contaminants and that they would be more cautious in material acceptance.

8. Do you have any projects requiring general on-site fill? How about for materials that meet industrial site requirements?

9. How do transportation/delivery fees impact your selection of materials? Can you accept barge shipments?

Contractors would incorporate transportation/delivery fees as well as purchase price, profit, and overhead into bid material costs.

10. Do you see a continuing demand for these materials in the near future (2-5 years, i.e., upcoming projects)?

Yes

11. Could you describe the current price trends for these materials?

12. Are you working on or do you have upcoming projects on a Brownsfield Site where industrial level materials are acceptable? Are there projects on hold because of the high cost of new fill material?

13. If you had an alternative source, with which additional regulatory approvals are likely (i.e. using sand slightly above unrestricted use criteria), would you be interested in this material? Have you attempted it before?

14. Is there something perception wise that would make a material unacceptable?

PE15 is wary of material from sources that are known to be contaminated.

15. Do you offer incentives in your contracts for use of recycled material (such as glass aggregate)?

PE15 does not think there are incentives for use of recycled material on projects; however, PE15 has established specific requirements for use of recycled material on projects.

Requirements for Approval of Import Material:

Contact from PE15 indicated that because of the variety of materials that PE15 uses on projects guidelines for material approval are not straightforward. For materials that are naturally occurring aggregates, "virgin materials," the source must be permitted through a process that identifies potential contaminants. For recycled materials, the WSDOT Specifications Section 9-03.21 should be consulted. Prior to importing recycled materials to a job site, materials must be evaluated for leaching and potential contaminants under WAC 173-303. The WSDOT Specifications identify specific allowable percentages of recycled material for project use.

PE15 also provided the following example: A contractor is excavating soil from a site and believes the material would be a good base material. The contractor wants to stockpile the material and use it on PE15 projects, however, PE15 does not consider the excavated material to be a "virgin" material and it hasn't gone through the permitting required to be an aggregate source. Thus, PE15 has strong concerns about the history and potential contamination of the material. PE15 will require that the material be tested under the requirements of WAC 173-303 prior to use on its projects.

General Notes:

Appendix C
Initial Market Survey Response – Material Suppliers

Initial Market Survey Response – Material Suppliers

Communication Log

Initial Market Survey Response – Material Supplier 1

Initial Market Survey Response – Material Supplier 2

Initial Market Survey Response – Material Supplier 3

Initial Market Survey Response – Material Supplier 4

Initial Market Survey Response – Material Supplier 5

Initial Market Survey Response – Material Supplier 6

Initial Market Survey Response – Material Supplier 7

Initial Market Survey Response – Material Supplier 8

Initial Market Survey Response – Material Supplier 9

Initial Market Survey Response – Material Supplier 10

Initial Market Survey Response – Material Supplier 11

Initial Market Survey Response – Material Supplier 12

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Initial Market Survey Response – Material Supplier 19

Initial Market Survey Response – Material Supplier 20

Initial Market Survey Response – Material Supplier 21

Initial Market Survey Response – Material Supplier 22

Initial Market Survey Response – Material Supplier 24

Initial Market Survey Response – Material Supplier 26

Initial Market Survey Response – Material Supplier 27

Initial Market Survey Response – Material Supplier 28

Initial Market Survey Response – Material Supplier 29

Note: Communication Log details communications with all Material Suppliers. Partial or complete responses from Material Suppliers are included in this appendix. For cases in which contact was not established or no information was garnered, response forms have been omitted.

Initial Market Survey Responses – Material Suppliers

Communication Log

Date	Communication
Material Supplier 1 (MS1)	
10/30/2008	Phone call placed to MS1, left voicemail
11/18/2008	Phone call placed to MS1, notes from discussion recorded
1/9/2009	No further contact with MS1
Material Supplier 2 (MS2)	
10/30/2008	Phone call placed to MS2, MS2 requested email, email sent to MS2
10/30/2008	MS2 returned phone call, notes from discussion recorded
11/3/2008	Email follow up received from MS2, information incorporated into notes
1/9/2009	No further contact with MS2
Material Supplier 3 (MS3)	
10/30/2008	Phone call placed to MS3, notes from discussion recorded, will fax price list
1/9/2009	Information not received from MS3, no further contact with MS3
Material Supplier 4 (MS4)	
10/30/2008	Phone call placed to MS4, left voicemail
10/30/2008	MS4 returned phone call, notes from discussion recorded
1/9/2008	No further contact with MS4
Material Supplier 5 (MS5)	
10/30/2008	Phone call placed to MS5, notes from discussion recorded, will fax prices
1/9/2009	Information not received from MS5, no further contact with MS5
Material Supplier 6 (MS6)	
10/30/2008	Phone call placed to MS6, left voicemail
10/30/2008	MS6 returned phone call, notes from discussion recorded
1/9/2008	No further contact with MS6
Material Supplier 7 (MS7)	
10/30/2008	Phone call placed to MS7, notes from discussion recorded
1/9/2009	No further contact with MS7
Material Supplier 8 (MS8)	
10/30/2008	Phone call placed to MS8, left voicemail
10/30/2008	MS8 returned phone call, notes from discussion recorded
1/9/2009	No further contact with MS8
Material Supplier 9 (MS9)	
10/30/2008	Phone call placed to MS9, notes from discussion recorded
1/9/2009	No further contact with MS9
Material Supplier 10 (MS10)	

Date	Communication
10/30/2008	Phone call placed to MS10, left voicemail
11/18/2008	Phone call placed to MS10, notes from discussion recorded
1/9/2009	No further contact with MS10
Material Supplier 11 (MS11)	
10/30/2008	Phone call placed to MS11, notes from discussion recorded
1/9/2009	No further contact with MS11
Material Supplier 12 (MS12)	
10/31/2008	Phone call placed to MS12, left voicemail
10/31/2008	MS12 returned phone call, notes from discussion recorded
1/9/2009	No further contact with MS12
Material Supplier 13 (MS13)	
10/31/2008	Phone call placed to MS13, left voicemail
10/31/2008	MS13 returned phone call, left voicemail
10/31/2008	Phone call returned to MS13, left voicemail
1/9/2009	Contact not established with MS13
Material Supplier 14 (MS14)	
10/30/2008	Phone call placed to MS14, notes from discussion recorded
1/9/2009	No further contact with MS14
Material Supplier 15 (MS15)	
10/30/2008	Phone call placed to MS15, left voicemail
10/31/2008	MS15 returned phone call, left voicemail
10/31/2008	Returned phone call to MS15, left voicemail
10/31/2008	MS15, returned phone call, notes from discussion recorded
1/9/2009	No further contact with MS15
Material Supplier 16 (MS16)	
10/30/2008	Phone call placed to MS16, notes from discussion recorded
1/9/2009	No further contact with MS16
Material Supplier 17 (MS17)	
10/30/2008	Phone call placed to MS17, left voicemail
10/31/2008	MS17 returned phone call, left voicemail requesting email, email sent
11/3/2008	Email response received from MS17, information incorporated into notes
1/9/2009	No further contact with MS17
Material Supplier 18 (MS18)	
10/31/2008	Phone call placed to MS18, left voicemail
10/31/2008	MS18 returned phone call, left voicemail
10/31/2008	Returned phone call to MS18
11/5/2008	MS18 returned phone call, notes from discussion recorded
1/9/2009	No further contact with MS18
Material Supplier 19 (MS19)	
10/30/2008	Phone call placed to MS19, notes from discussion recorded, estimator will send pricing information

Date	Communication
1/9/2009	No further information garnered from MS19
Material Supplier 20 (MS20)	
10/31/2008	Phone call placed to MS20, left voicemail
10/31/2008	MS20 returned phone call, notes from discussion recorded
1/9/2009	No further contact with MS20
Material Supplier 21 (MS21)	
10/30/2008	Phone call placed to MS21, notes from discussion recorded
1/9/2009	No further contact with MS21
Material Supplier 22 (MS22)	
11/10/2009	Phone call placed to MS22
1/9/2009	No further contact with MS22
Material Supplier 23 (MS23)	
11/6/2008	Phone call placed to MS23, left voicemail
1/9/2009	Contact not established with MS23
Material Supplier 24 (MS24)	
10/30/2008	Phone call placed to MS24, notes from discussion recorded
1/9/2009	No further contact with MS24
Material Supplier 25 (MS25)	
10/30/2008	Phone call placed to MS25
1/9/2009	Contact not established with MS25
Material Supplier 26 (MS26)	
10/30/2008	Phone call placed to MS26, notes from discussion recorded
1/9/2009	No further contact with MS26
Material Supplier 27 (MS27)	
10/30/2008	Phone call placed to MS27, left voicemail
10/31/2008	MS27 returned phone call, left voicemail
10/31/2008	Returned phone call to MS27, notes from discussion recorded, MS27 will send prices
1/9/2009	Information not received from MS27, no further contact with MS27
Material Supplier 28 (MS28)	
10/30/2008	Placed phone call to MS28, notes from discussion recorded, MS28 requested email follow up, email sent to MS28
11/6/2008	Email response received from MS28, information incorporated into notes
1/9/2009	No further contact with MS28
Material Supplier 29 (MS29)	
10/30/2008	Phone call placed to MS29, notes from discussion recorded
1/9/2009	No further contact with MS29

Initial Market Survey Responses - Material Supplier 1 (MS1)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

Cement

2. What is the price per cubic yard or price per ton that the material is retailed for?

$110/ton Freight on Board Portland; larger projects can expect to see more aggressive pricing.

3. How do you typically assess delivery fees?

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

- Contact information for fly ash supplier provided.

Initial Market Survey Responses – Material Supplier 2 (MS2)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

Organoclay; MS2 previously worked on a large sediment stabilization project in the Portland area.

2. What is the price per cubic yard or price per ton that the material is retailed for?

The price of organoclay is approximately $1.30/pound for a truck load, where a truck load equals 40,000 pounds. Product is also available in 45 pound bags and 150 super sacks; however, MS2 will sell any amount desired.

3. How do you typically assess delivery fees?

Material ships in containers, in bulk in trucks, and/or palletized depending on the amount of material and where it is going. MS2 will arrage lowest possible freight rates.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Frieght rates are fluctuating wildly with fuel surcharges. Additionally, materials are hydrocarbon based; therefore, fuel costs also drive prices for materials and transport.

5. Have you seen a decrease in demand lately? Are projects dropping off?

Demand for organoclay does not seem like it is decreasing; MS2 is finding new applications.

General Notes:

- MS2 also supplies material for barrier walls. This material is less expensive ($0.78-0.79/pound) and features an impermeable gravel core.
- MS2 has experience with Oregon Department of Environmental Quality at another site in Portland, Oregon.

Initial Market Survey Responses – Material Supplier 3 (MS3)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS3 sells compost, topsoil/three-way blended soil, fill sand, and concrete sand.

2. What is the price per cubic yard or price per ton that the material is retailed for?

MS3 will fax November 1, 2008 price list.

3. How do you typically assess delivery fees?

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Prices of material supplied by MS3 have not been volatile. MS3 does not have a sense of potential market trends.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 4 (MS4)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS4 supplies glass aggregate. Glass aggregate is 5/8-inch glass cutlet from broken stained glass windows. Material has been used for buried pipes and bridges, but it can be very sharp and should not be used in an application where it could be exposed.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Picked up from the plant in Redmond, glass aggregate is $7.00/ton as opposed to $16.00/ton for crushed rock of the same size.

3. How do you typically assess delivery fees?

MS4 will not deliver to Portland.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Cement, concrete (6 percent increase in price), and rock products tend to be increasing in price, whereas lumber prices are decreasing. Asphalt prices might come down because gas prices are coming down.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 5 (MS5)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

Mason sand

2. What is the price per cubic yard or price per ton that the material is retailed for?

MS5 will send budgetary costs via fax based on an approximate of 5,000 tons of material.

3. How do you typically assess delivery fees?

Delivery fees to Terminal 4 area in Portland will be included with costs.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

MS5 feels that there has been a lot of volatility in costs recently and overall things will escalate in the future.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 6 (MS6)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

Organoclay (bulk)

2. What is the price per cubic yard or price per ton that the material is retailed for?

Organoclay is priced at $1.45/pound and is typically sold in super sacks or in bulk.

3. How do you typically assess delivery fees?

Delivery fees are based on the amount of material ordered.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Generally costs are higher and there is more leeway on large quantities than there has been in the past.

5. Have you seen a decrease in demand lately? Are projects dropping off?

Unsure of changes.

General Notes:

- Product has been used at sediment remediation sites in Portland.

Initial Market Survey Responses – Material Supplier 7 (MS7)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS7 supplies sand (fill sand and mason), compost (compost and organic plus), and topsoil (three-way mix).

2. What is the price per cubic yard or price per ton that the material is retailed for?

Prices for fill and mason sand are $27.00/cubic yard. Prices for compost and top soil products are $26.00/cubic yard.

3. How do you typically assess delivery fees?

MS7 is located in Vancouver, Washington. For locations that are right across the bridge in Portland, delivery fees are $35.00/load. Truck size varies by weight.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Not sure

5. Have you seen a decrease in demand lately? Are projects dropping off?

Not sure

General Notes:

Initial Market Survey Responses – Material Supplier 8 (MS8)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS8 supplies topsoil and compost.

2. What is the price per cubic yard or price per ton that the material is retailed for?

MS8 will not provide topsoil prices without a specification. Price for compost picked up at the facility is $80-85/unit, where each unit is 7.5 yards.

3. How do you typically assess delivery fees?

For compost delivered to north Portland, delivery fees are $15-20/unit where each unit is based on 7.5 yards. (Note: fees for delivered material were quoted as $100/unit; delivery fees were obtained by subtracting price of material picked up at facility).

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

MS8 has not seen price volatility in materials; main fluctuations are in fuel prices. MS8 expects fuel costs to remain high unless the economy goes into a depression.

5. Have you seen a decrease in demand lately? Are projects dropping off?

MS8 has seen a drop in purchasing during the last 2 weeks. There are less individual buyers, but commerical jobs appear to be still going. MS8 is unsure of the outlook for next year.

General Notes:

- Provided a recommendation for sand suppliers in the Vancouver, Washington area.

Initial Market Survey Responses – Material Supplier 9 (MS9)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS9 supplies organoclay; however, MS9's product has never been used in this type of application before.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Price of organoclay is $2.75-3.00/pound. For large quantities, price may be reduced to $1.50-1.75/pound.

3. How do you typically assess delivery fees?

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 10 (MS10)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS10 supplies mason and fill sand.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Mason sand retails for $8.50/ton; fill sand retails for $6.00/ton.

3. How do you typically assess delivery fees?

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

MS10 anticipates that costs will probably go up a bit; however, costs have been pretty level for the last 3 to 4 years.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

- Product is dredged from the Columbia River.

Initial Market Survey Responses – Material Supplier 11 (MS11)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS11 supplies glass aggregate.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Glass aggregate is $3.00/ton. For amounts over 1,500 tons, price is $2.50/ton.

3. How do you typically assess delivery fees?

MS11 does not deliver. All prices are for material picked up at the facility.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Costs for aggregate have been relativly constant.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

- This product has been used as backfill.

Initial Market Survey Responses – Material Supplier 12 (MS12)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

Sand

2. What is the price per cubic yard or price per ton that the material is retailed for?

MS12 anticipates sand will be approximately $8.50/ton.

3. How do you typically assess delivery fees?

Delivery fees are typically around $5.00/ton.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Right now material prices and the cost of business are going up because fuel prices are escalating. Price increases come and go.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

- MS12 stated that these prices are most likely at the high end of costs, which could be expected over the next year to year and a half.

Initial Market Survey Responses – Material Supplier 14 (MS14)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS14 supplies sand, topsoil (50/50 two-way blend, 75/25 two-way blend, and a three-way blend), and compost (yard debris compost and hemlock compost).

2. What is the price per cubic yard or price per ton that the material is retailed for?

For small loads, sand costs $23/cubic yard, topsoil costs $15/cubic yard, and compost costs $22/cubic yard. For large amounts of materials, prices are 20 percent off the aforemetioned prices (sand costs $18.40/cubic yard, topsoil costs $12/cubic yard, and compost costs $17.60/cubic yard).

3. How do you typically assess delivery fees?

Delivery fees depend on fuel prices and distance. For belly dumps from live bottom trailers, delivery costs could be approximately $10/cubic yard.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

MS14 does not think material or fuel prices will increase substantially over the next year. Generally, the price of materials from MS14 change annually in approximately 10 percent intervals.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 15 (MS15)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS15 supplies Class C and Class F fly ash. Class C has a higher lime content. In most cases, Class C would give a better performance for water absorption.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Fly ash costs approximately $55/ton today, and prices in a year to year and a half could be around $60/ton.

3. How do you typically assess delivery fees?

For delivery to the Portland metro area, a very rough approximate delivery cost is $20-22/ton.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Fly ash costs have been pretty stable. In times like this, when the constuction market is down, 90 to 95 percent of sales are to redimix companies and 100 percent of product goes to the construction industry.

5. Have you seen a decrease in demand lately? Are projects dropping off?

No, there has not been a decrease in demand. Contractors tend to replace a portion of the cement in concrete with flyash because it is 65 to 70 percent of the price of cement and it still produces good quality products. It may even make products better. A lot of people are still learning the benefits.

General Notes:

- Class F fly ash produced from this plant has a very high lime content as Class F fly ash goes. Class C fly ash has higher lime content than Class F and can be used to firm up excess water.
- Can provide samples of Class F and C to test in the future, if desired.

Initial Market Survey Responses – Material Supplier 16 (MS16)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS16 does not directly sell sand but was able to give information about a partner sand vendor.

2. What is the price per cubic yard or price per ton that the material is retailed for?

2007 price of concrete sand was $9.75/ton. Fill sand costs were $7.00/ton.

3. How do you typically assess delivery fees?

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 17 (MS17)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS17 sells sand.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Sand is sold for $8.00/ton (picked up).

3. How do you typically assess delivery fees?

Specific location is necessary to assess delivery fees.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 18 (MS18)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS18 sells cement and Class F fly ash.

2. What is the price per cubic yard or price per ton that the material is retailed for?

Fly ash is sold for $45/ton. Cement prices range from $110-115/ton (includes April 2009 price increase).

3. How do you typically assess delivery fees?

MS18 facility is located in Longview, Washington. Frieght for fly ash to Portland would be approximately $12-15/ton. Freight for cement to Portland would be $7-10/ton.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Fly ash prices are not anticipated to increase for the next year to year and a half. Aforementioned cement prices include increase projected for April 2009.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

Initial Market Survey Responses – Material Supplier 19 (MS19)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS19 sells sand (mason and fill), topsoil (blended soil, sandy loam, and gardener's choice), and compost (garden and mushroom).

2. What is the price per cubic yard or price per ton that the material is retailed for?

Pricing information was not received.

3. How do you typically assess delivery fees?

Pricing information was not received.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

For the last 6 months, prices have been pretty steady. Generally, prices in spring show more volatility—mainly in the cost of processing.

5. Have you seen a decrease in demand lately? Are projects dropping off?

Much of MS19's mason sand has been tied up with an ongoing project; however, MS19 has multiple sources available.

General Notes:

Initial Market Survey Responses – Material Supplier 20 (MS20)

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS20 sells cement.

2. What is the price per cubic yard or price per ton that the material is retailed for?

The price for cement picked up at the plant is $110/ton. Freight charges are additional.

3. How do you typically assess delivery fees?

Delivery fees are approximately $10-12/ton. There is an additional frieght fuel surcharge freight for delivery in Portland. In total, costs would be $120-125/ton delivered.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

Cement prices have been volatile. On January 1, 2009, there will be a $5/ton increase and another $5-10/ton increase is likely later in the year. There have been significant pressures on prices. Cement is a high energy use product, which is offset by the benefits the product produces. The cost of business and insurance are continually going up.

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes:

- MS20 recommended several vendors of fly ash.

Initial Market Survey Responses – Material Supplier 21 (MS21)

Communication Log

10/30/2009 –1/9/2009 –

Questions

1. Which of the following materials do you sell: sand, topsoil, Portland cement, fly ash, organo/sorbent clay, compost, glass aggregate?

MS21 sells soil and compost (which is a mix of 50 percent compost and 40 percent screened dirt).

2. What is the price per cubic yard or price per ton that the material is retailed for?

Soil costs $21/cubic yard. Compost costs $26/cubic yard.

3. How do you typically assess delivery fees?

Delivery fees are charged by distance to site from closest yard.

4. Things have been volatile with costs recently and the project is likely a few years out - do you have any sense of the market trends for the aforementioned products?

5. Have you seen a decrease in demand lately? Are projects dropping off?

General Notes: